Remarks

This is in response to the Examiner's action mailed January 30, 2003. Claims 4 through 24 are pending in the application. The Examiner has entered an objection to the drawings and has rejected claims 4 through 24. The applicants have amended Figure 6 and the specification in response to the Examiner's objection. No new matter has been added. The applicants have amended claims 12 and 22 and have canceled, without prejudice, claims 23 and 24. The applicants have further added new claims 25 through 28.

The drawings are objected to under 37 CFR 1.83(a). In particular, the Examiner states that the "plurality of independently operable light emitting devices" and "the volume diffuse[r] further comprises a plurality of louvers disposed to inhibit cross-talk of light between separate light emitting devices" must be shown. Applicants propose an amended Fig. 6, shown in Appendix A, for review by the Examiner. Elements 512 and 514 in the new Fig. 6 are described in reference to Fig. 5(a). In particular, element 512 is described on page 15, lines 22-23, and element 514 is described on page 15, line 23. The Specification has been amended to reflect changes in Fig. 6 by adding reference numerals identifying elements already described. The amended drawings are now fully in compliance with 37 CFR 1.83(a). Therefore the applicants respectfully request withdrawal of the objection.

Claims 4 through 6, 11 through 15 are rejected under 35 U.S.C. 103(a) as being unpatentable in view of Patent Cooperation Treaty publication 98/17083 ("Horikx *et al.*") in combination with United States patent 5,910,706 ("Stevens *et al.*") , European patent application 0969699 ("Perlo *et al.*"), and US Patent 6,199,995 ("Umemoto *et al.*"). The Examiner states that the Horikx *et al.* reference shows "an information display ... comprising: a plurality of light emitting devices ..., and a frustrator element comprising a volume diffuser with particles ...." The Examiner further states that the Stevens *et al.* patent shows "independent LEDs ... and an antireflective element," that the Perlo *et al.* reference teaches "a diffusive surface ..., microstructured structures," and that the Umemoto *et al.* patent teaches voids. The Examiner states that it would have been obvious to have independent LEDs of the Stevens *et al.* patent and voids of the Umemoto *et al.* patent with the device of the Horikx *et al.* reference. The applicants respectfully disagree.

The Horikx *et al.* reference discloses an "illumination system having a substrate and an active layer" and a "display device ... comprising such an illumination device." Contrary to the Examiner's assertion, the Horikx *et al.* reference does not teach a display including "a plurality of light emitting elements." The Examiner cites lines 25 and 26 of page 6 of the Horikx *et al.* reference for such teaching, but that passage simply discusses the advantages of polymer LEDs. It does not state that more than one LED is used in a single display.

The Examiner states that it would be obvious to combine the teaching of the Horikx *et al.* reference with that of the Stevens *et al.* patent. Specifically the Examiner states that "[O]ne would be motivated to have pixilated control of the thin film electroluminescent device **as needed for semiconductors**" (emphasis added). The Examiner cites no reference for the assertion that pixilated control is needed for semiconductors. In fact, the Horikx *et al.* reference proves that this is a false statement. The Horikx *et al.* reference teaches the use of a light guide with a single semiconductor device (the thin film LED). In fact, there would be no motivation to combine these two references because the entire goals of the two apparatuses are opposite. While the Horikx *et al.* reference teaches spreading the light from a single light emitter uniformly over an entire display, the Stevens *et al.* reference teaches a pixilated display using multiple light emitters. In such a display it is important that the light from each light emitter be confined to its own pixel. These references teach directly away from one another. Therefore one would not combine the light spreading device of the Horikx *et al.* reference with the pixilated emitters of the Stevens *et al.* patent. Clearly, the present invention as defined by all of the claims in the present application, is not obvious in view of these references. Neither the Perlo *et al.* reference nor the Umemto *et al.* patent add anything that would make the inventions of the independent claims of the present application obvious.

Without acquiescing in the Examiner's rejection, claims 5, 6, and 13 through 15 are patentable since these claims depend from claims that are patentable for the reasons setforth herein, these claims are patentable at least for the same reasons and the rejection is rendered moot.

The Examiner has rejected the remaining claims in the present application over a variety of combinations of the four references discussed above along with three other references. Without acquiescing in the Examiner's rejection, since these claims depend from claims that are

patentable for the reasons setforth herein, these claims are patentable at least for the same reasons and the rejection is rendered moot.

While the applicants will not discuss the remaining rejections in detail, they observe that the Examiner has made numerous characterizations of the references that are not accurate. Some of these are described below. Omission of any statements made by the Examiner in the official action should not be taken as acquiescence thereto.

The Examiner states that "Perlo *et al.* teaches a diffusive surface (Fig. 7, #4). There is no teaching in the Perlo reference that would indicate that surface 4 is diffusive.

The Examiner states that "[i]t would have been obvious, to one having ordinary skill in the art at the time the invention was made, to have the voids of Umemoto *et al.* with the device of Horikx *et al.* since one would be motivated to use the voids for achieving efficient utilization of light." The Umemoto *et al.* patent does not state that voids are to be preferred over other types of diffusers and even if they are, there is no teaching in the Umemoto *et al.* patent that would lead one of ordinary skill in the art to the conclusion that they would be desirable in the significantly different device of the present invention.

The Examiner states that United States patent 6,297,908 ("Suga") teaches a diffuser comprising louvers absorptive of light. Instead the Suga patent discloses "a directional light-diffusing film that is configured with minute light-transmitting regions that pass light in the thickness direction and minute light-diffusing regions that diffuse light in the thickness direction, these regions being arranged in an alternating manner... ."

The Examiner states that "Beeson *et al.* teaches louvers primarily reflective." However Beeson discloses microprisms such that "rays traveling ... along the slab waveguide escape from the slab waveguide and reflect through the microprisms via **total internal reflection**" (emphasis added). Total internal reflection is a phenomenon that occurs in transparent materials when light strikes a surface at an angle greater than the critical angle. Such surfaces cannot reasonably be said to be reflective. Futermore, the Beeson patent does not teach louvers at all..

The Examiner states that "Arai *et al.* teaches the diffuser between the light source and transmissive layher (Fig. 6, #5 on the right) and the diffuser between the transmissive layer and view position (Fig. 6, #5 on the left)." The applicants do not understand the Examiner's comment since Figure 6 of the Arai *et al.* patent is a graph of luminance against measurement

direction for S and P polarized light. It does not show any part of a display nor does it have any reference numbers.

In view of the amendments and reasons provided above, it is believed that the pending claims are in condition for allowance. Applicants respectfully request favorable consideration and early allowance of the pending claims.

Respectfully submitted,

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Appendix A

Fig. 6 (Amended)

The changes to Figure 6 are shown in red on the attached drawing.

Appendix B

Version with markings to show amendments made

On page 4, please replace the paragraph starting on line 9 and ending on line 10 with the following paragraph:

Fig. 6 is a schematic representation of ~~a resolution maintaining volume diffuser~~ an emissive display that includes microlouvers.

On pages 20-21, please replace the paragraph starting on page 20, line 30 and ending on page 21, line 6 with the following paragraph:

To help reduce cross-talk between pixels, the spacing between absorptive elements 614 is preferably on the order of the distance between pixels or smaller. For example, the spacing between absorptive elements 614 can be the same as the spacing between pixels, and element 610 can be disposed between the emissive devices 512 patterned into pixels and the substrate 514 so that each pixel emits directly through a transmissive/diffusive region 612. Alternatively, the spacing between absorptive elements 614 can be made much smaller than the pixel spacing so that alignment between pixels and element 610 is less of an issue.

Appendix C

Clean version of claims amended

12. An information display comprising:

an optically transmissive layer;

a plurality of independently operable light emitting devices disposed to emit light through the transmissive layer, thereby being capable of displaying information to a viewer;

a first frustrator element disposed onto the transmissive layer and having a microstructured surface facing the viewer, the microstructured surface comprising a plurality of prismatic microstructures; and

a second frustrator element comprising a volume diffuser disposed between the microstructured surface and the transmissive layer, the first and second frustrator elements frustrating total internal reflections of light emitted by the plurality of independently operable light emitting devices.

22. An information display comprising:

an optically transmissive layer;

a plurality of independently operable light emitting devices disposed to emit light through the transmissive layer toward a viewer;

a first frustrator element disposed onto the transmissive layer and having a microstructured surface facing the viewer, the microstructured surface comprising a plurality of parallel, spaced-apart, V-shaped grooves, the spacing defining a flat top portion between the microstructures; and

a second frustrator element comprising a volume diffuser disposed between the microstructured surface and the transmissive layer, the first and second frustrator elements frustrating total internal reflections of light emitted by the plurality of independently operable light emitting devices.